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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,811	07/14/2003	Jin-Young Lee	61610078US	4174
58/027	7/5/00	04/30/2009		
H.C. PARK & ASSOCIATES, PLC 8500 LEESBURG PIKE SUITE 7500 VIENNA, VA 22182			EXAMINER LEE, CYNTHIA K	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 04/30/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATENT@PARK-LAW.COM

### Office Action Summary

**Application No.**

10/617,811

**Applicant(s)**

LEE ET AL.

**Examiner**

CYNTHIA LEE

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 18 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,4,8-12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 8-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

This Office Action is responsive to arguments filed on 2/18/2008. Claims 1, 3, 4, 8-12 and 14-16 are pending. Claims 14-16 are withdrawn from further consideration as being drawn to a non-elected invention. Claims 1, 3, 4, 8-12 are finally rejected for reasons stated herein below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3, 4, and 8-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation in claim 1, "where p is 3 to 6 when R is a C1 alkyl" is not supported by the disclosure as originally filed.

Applicant is required to cancel the new matter in reply to this Office Action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11-273731) in view of Ueda (WO 02/40404 (using US 7351500 as English translation)).

Naoki discloses a lithium ion secondary battery comprising a positive electrode including a material that is capable of reversible intercalation/deintercalation of lithium ions as a positive material (particularly  $\text{LiCoO}_2$ ,  $\text{LiMn}_2\text{O}_4$ ,  $\text{LiNiO}_2$ ), a negative electrode including a material capable of reversible intercalation/deintercalation of lithium ions as a negative material, a separator interposed between the positive and negative electrodes, and an electrolyte on the separator wherein the electrolyte includes a non-aqueous organic solvent, a lithium salt, and a linear polymer having  $\text{P}=\text{O}$  bonds (Abstract and [0028, 0029, 0031, 0033]). (Applicant's claim 1)

Naoki discloses using non-aqueous organic solvents comprising cyclic and linear carbonates, such as ethylene carbonate (EC), propylene carbonate (PC), dimethyl carbonate (DMC), methylethyl carbonate (MEC), diethylene carbonate (DEC), used independently or in combination [0028]. (Applicant's claims 3, 4)

Naoki discloses lithium salts comprising  $\text{LiPF}_6$ ,  $\text{LiBF}_4$ ,  $\text{LiClO}_4$ ,  $\text{Li}(\text{SO}_2\text{CF}_3)_2$ ,  $\text{Li}(\text{SO}_2\text{CF}_3)_3$  in the amount of between 1M and 1.7M [0029]. (Applicant's claims 9 and 10)

Naoki discloses wherein the electrolyte includes a polymerized phosphoric ester, as illustrated as formula. 3.

Regarding the limitation "about 0.005 to less than 5 wt% based on the total amount of electrolyte" in claim 1, Naoki discloses that when the polymer phosphoric ester is present in more than 2 vol% in an electrolytic solution, generation of the vicious coat on the front face of the negative electrode can be controlled, a good load characteristic can be acquired, and lowering of the load characteristic by the increment in viscosity can be controlled by carrying out to below 50 vol% [0026]. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists, see MPEP 2144.05. Further, Naoki clearly teaching that the amount of the phosphoric ester polymer is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Naoki does not disclose the aromatic hydrocarbon solvent as claimed in claim 1. Ueda teaches of using an aromatic compounds, such as benzenes having an alkyl group such as cyclohexylbenzene and t-butylbenzene, biphenyl, or fluorobenzenes to enhance to the safety and storage characteristics of the battery (10:1-5), thus teaching that the aromatic compound is a result effective variable. It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an aromatic compound as taught by Ueda, for the benefit of improving battery characteristics. Regarding claim 8, it has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP

2144.05. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). MPEP 2144.05

Claims 11 and 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11-273731) in view of Ueda (WO 02/40404 (using US 7351500 as English translation)) as applied to claim 1, further in view of Yeager (US 2002/0177027).

Naoki discloses all the elements of claim 1 and is incorporated herein. Naoki does not disclose wherein the electrolyte includes a phosphonate as claimed in claims 11 and 12. However, Yeager discloses that dialkylvinylphosphonates, such as diethylvinylphosphonate ([0071], lines 11-12 from the bottom) are used as flame retardants. It is commonly known in the art that thermal instability and explosions are problems with batteries, particularly Li ion batteries, as disclosed by Naoki [0003]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to polymerize dialkylvinylphosphonates instead of a phosphoric ester for the benefit of reducing explosions and thus, making a safer Li ion battery. Considering the limited number of species in the class of dialkylvinylphosphonates, it is found that dimethylvinylphosphonate and dipropylvinylphosphonate are obvious for the same reason given above.

### ***Response to Arguments***

Applicant's arguments filed 2/18/2009 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Cynthia Lee/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
Supervisory Patent Examiner, Art  
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